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Mandatory Medication Indications in Electronic Systems – The Prescriber Perspective

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Abstract. As hospitals transition from paper to electronic medication charts, an opportunity exists to 'nudge' prescribers to document medication indications by making this data-entry field mandatory. The aim of this study was to explore hospital doctors' perceptions of mandatory documentation of indications in an electronic medication management (EMM) system. Ten junior doctors took part in brief semi-structured interviews. Participants identified improved communication among staff as a key benefit of indication documentation. Recording indications was also seen to act as a prompt for medication review. Despite these benefits, indication documentation for all medications would be challenging to implement in practice. Users of the EMM system (i.e. junior doctors) explained that they are time poor and are often tasked with transcribing medication orders into the electronic system with limited knowledge of why medications are being prescribed. Determining the indication for use would require additional time and effort, and prescribers reported a high risk of working around the system if indication documentation was made mandatory.

Keywords. Electronic medication management, medication indication, mandatory documentation

1. Introduction

Documenting the indication or purpose for a medication is considered best practice when prescribing [1]. It has been suggested that in addition to the five rights of safe medication use (the right patient, right drug, right dose, right route and right time), a sixth right be added – *the right indication* [2]. Australia's paper-based National Inpatient Medication Chart (NIMC), used in all Australian hospitals yet to implement electronic medication management, includes a field for medical staff to document each medication's indication [3]. Its purpose is to allow the medication order to be reviewed in the context of why the medication was prescribed, reducing the risk of an order being misinterpreted or misread

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[3]. Despite its inclusion, the field is not often used, with audits revealing that indications are typically documented less than 10% of the time [4].

As hospitals transition from paper to electronic medication charts, an opportunity now exists to 'nudge' prescribers to document medication indications by making this data-entry field mandatory. Anecdotally, some Australian hospitals have configured systems so that indication documentation is mandatory, while others have made this field optional. But what are the opportunity costs associated with making this data-entry field mandatory? And what are the benefits and risks of mandatory indication documentation? The aim of this study was to explore hospital doctors' perceptions of mandatory documentation of medication indications in an electronic medication management (EMM) system.

2. Method

2.1. Study site, medication management system and participants

The study was conducted at a 320-bed teaching hospital in Sydney, Australia. All hospital wards, expect for the emergency department, used the EMM system, MedChart®, for electronic prescribing, pharmacy review and medication administration. During prescribing, no specific data-entry fields were available for recording indications.

Prescribers at the hospital were opportunistically recruited via direct approach (i.e. directly approached while working on wards) and invited to participate in a brief semi-structured interview. Junior doctors were targeted for recruitment, as previous research indicated that junior doctors were more likely to use the system [5]. Ten prescribers were invited and all agreed to take part. These included two interns, six residents and two registrars.

2.2. Procedure

This study formed part of a larger project investigating antimicrobial prescribing at the study hospital. Interview questions focused on the current process for documenting indications and gaining approval for use of antimicrobials. At the end of the interview, prescribers were asked two questions about documenting indications for medications more broadly:

- What do you think about documenting indications more generally? That is, having to document an indication for every order?
- What impact do you think documenting the indication will have?

All interviews were audiotaped and transcribed verbatim. Responses to these two questions were de-identified and independently analyzed by two researchers. A general inductive approach [6] was used, where no a-priori framework was used to guide analysis. The two researchers came together to reach a consensus on positive and negative perceptions of recording medication indications in the electronic system.

3. Results

Table 1 summarizes the main themes that emerged from interviews with respect to recording medication indications in the EMM system. Most doctors held the view that recording indications was good practice, and theoretically should be done for all medications. For example, a doctor said: *"I think that's very rational."* (D2) However many doctors were not sure whether the benefits of having an indication available outweighed the added burden this would create for doctors.

Table 1. Prescriber perceptions of recording indications for all medications in the electronic medication management system.

Main benefits	Practical difficulties	Risks
Improved communication between hospital staff	Not all indications are known	Workarounds
Prompts prescriber to review medications	Extra time and effort for prescribers	Poor information quality

3.1. Main benefits of recording medication indications

The primary benefit of recording indications in the EMM system was reported to be improved communication among hospital staff. For example, participants said: *"I'm in cardiology at the moment and it's really helpful to know why people are on certain types of medications over other ones. And it makes it very clear for everyone subsequently."* (D2)

And: *"I think it is great, it's what you need, especially from the dispensing point of view, to know why you are dispensing this. And it is good, you know the other medical teams to come in say hey they are on this for this reason".* (D5)

Another benefit was viewed to be the medication review that typically accompanies determining an indication for a medication. A doctor explained: *"I think there's a couple of times when patients would come in on things and you would have no bloody idea why it's been prescribed…That can be difficult but I often think it's a good time to review that medication…So I think it's quite good when you have to think about the indications because if you've got someone on 6 tablets for one thing and you realize that they could be on 3 tablets for one thing, it's a good time that you can actually make changes"*. (D10)

3.2. Practical difficulties associated with recording medication indications

Almost all participants reported the main difficulty associated with recording indications to be the extra work this would create for prescribers. A doctor said: *"It seems like it could be a lot of work, especially, for patients on say the transplant team who are on 30 or 40 medicines. To scroll through every single one and pick out an indication…"* (D5) Doctors also described situations where it would be particularly difficult to find the time to document indications (e.g. after-hours, when a patient has just been admitted).

Another key barrier to documenting medication indications was reported to be the fact that not all medication indications are known. *"Some of the indications are difficult to ascertain, especially if some of the patients have been on these medications for quite a long time from the GP. And as a JMO (junior medical officer), if you don't know the indication, you can't write down anything, so then what's going to stop people from not writing down anything in the first place?"* (D7) This was particularly a problem for

junior doctors, who were often charged with 'transcribing' medication orders into the EMM system, rather than making prescribing decisions:

> *"I think that [recording indications] would be really beneficial only if the person doing it knew what they were doing. I can just remember as an intern, you know, you just copy whatever they are usually on, and sometimes you don't know why they are on this rather than something else."* (D1)

3.3. Risks associated with recording medication indications in the EMM system

As a consequence of the practical difficulties associated with recording indications, doctors expected that users would find ways to workaround the EMM system and either document non-indications (e.g. full stops and commas) or document inaccurate indications. A doctor explained: *"If you force people to write down the indication, they might write down garbage."* (D7)

And another: *"Time poor people having to do extra steps often cause people to cut corners where they don't see it of use. If there isn't good compliance or if it isn't used well that it might actually confuse people more…because if you have people using the system haphazardly and sort of putting in the standard indication without thinking about it and then someone comes along and says "look they're on frusemide for heart failure" when they're really on frusemide for some other indication."* (D9)

4. Discussion

This interview study revealed that although viewed to be best practice by prescribers, recording of indications for all medications would be challenging to implement in practice. Users of the EMM system (i.e. junior doctors) are time poor and are often tasked with transcribing medication orders into the electronic system with limited knowledge of why medications are being prescribed. Determining the indication for use would require additional time and effort, and prescribers reported a high risk of working around the system if data entry was made mandatory.

Participants identified a core benefit of recording indications to be improved communication among hospital staff. It is interesting to note that when asked to reflect on the impacts of documenting indications, prescribers focused on the immediate consequences of this practice on their work and on the work of others. No participants discussed impact more broadly, that is, to patients and to health professionals post-discharge (e.g. general practitioners, pharmacists). This likely reflects the *observability* [7] of these consequences. That is, increased workload is highly visible to prescribers, while the flow-on effects to external healthcare providers and to patients are less so.

Evidence of the positive impact of indication information on patients' medication management and on other healthcare providers is growing. For example, in a recent qualitative study, Australian consumers reported that having the indication on medication labels would make managing medications less confusing, especially when starting a new medication or when an alternative brand was dispensed [8]. Most consumers reported that they would be more likely to take their medication if they knew what it was for.[8] Research has also shown that pharmacists are more likely to identify prescribing errors when a prescription is accompanied by an indication, as this information facilitates a more comprehensive assessment of the medication order [9].

Another key benefit identified by prescribers in our study was that mandatory indication documentation could prompt prescribers to review a patient's medications. Potentially inappropriate polypharmacy occurs in approximately half of older hospitalized patients and is rarely addressed during routine hospital care [10, 11]. Thus, mandatory indication documentation should be implemented if this practice encourages medication review and subsequent deprescribing (i.e. the cessation of inappropriate medications). However, given that the prescribers entering medication orders into the EMM system are typically not the ones making the prescribing decisions, [5] further research is needed to determine how and in what contexts adding indications is beneficial, for example, in prompting medication review.

Workarounds are common when information technology does not align well with user workflow or when systems create additional work for users [12]. Data recorded into a system should be complete, but also accurate. In a previous study that assessed accuracy of indications documented for antimicrobials in an EMM system, doctors frequently entered inaccurate indications into the data-entry field in order to bypass the antimicrobial approval process and save time [13]. The data-entry field was mandatory, but in many cases, doctors entered nonsensical text (e.g. gduhb) to move past the perceived 'block' in prescribing [13]. As mentioned by a participant in our study, workarounds may also create additional risks, as inaccurate indications could be relied upon for subsequent decision making. Thus, minimizing, and if possible, streamlining any additional work for prescribers is recommended.

5. Conclusion

There are multiple benefits associated with having indication information available for all medication orders, however prescribers identified a number of practical difficulties and risks associated with mandatory indication documentation in EMM. Indication-based prescribing (i.e. selecting an indication, then medication) is gaining momentum internationally [9, 2]. The practical difficulties outlined here add to the raft of challenges already identified with indication-based prescribing, an ambitious attempt to shift prescribing work practices and thinking in order to improve patient safety.

References

[1] Recommendations to enhance accuracy of prescription/medication order writing, National Coordinating Council for Medication Error Reporting and Prevention, NCCMERP (2014). https://www.nccmerp.org/recommendations-enhance-accuracy-prescription-writing (accessed June 5, 2019)

[2] G.D. Schiff, E. Seoane-Vazquez, and A. Wright, Incorporating Indications into Medication Ordering--Time to Enter the Age of Reason, *New England Journal of Medicine* **375** (2016), 306-309.

[3] Guidelines for use of the National Inpatient Medication Chart including the paediatric version, Australian Commission on Safety and Quality in Health Care, (2009). https://www.safetyandquality.gov.au/wp-content/uploads/2012/01/24380-GuidelinesForNIMC2009.pdf (accessed June 5, 2019).

[4] J.A. Millar, R.C. Silla, G.E. Lee, and A. Berwick, The national inpatient medication chart: critical audit of design and performance at a tertiary hospital, *Medical Journal of Australia* **188** (2008), 95-99.

[5] M.T. Baysari, J.I. Westbrook, K.L. Richardson, and R.O. Day, The influence of computerized decision support on prescribing during ward-rounds: are the decision-makers targeted? *JAMIA* **18** (2011), 754-759.

[6] D.R. Thomas, A general inductive approach for analyzing qualitative evaluation data, *American Journal of Evaluation* **27** (2006), 237-246.

[7] R.R. Mackie and C.D. Wylie, Factors influencing acceptance of computer-based innovations, in M. Helander (Ed.), *Handbook of Human-Computer Interaction*, Elsevier Science Publishers, North-Holland, 1988, 1081-1106.
[8] M. Garada, A.J. McLachlan, G.D. Schiff, and E.C. Lehnbom, What do Australian consumers, pharmacists and prescribers think about documenting indications on prescriptions and dispensed medicines labels?: A qualitative study, *BMC Health Services Research* **17** (2017), 734.
[9] K. Kron, S. Myers, L. Volk, A. Nathan, P. Neri, A. Salazar, et al., Incorporating medication indications into the prescribing process, *American Journal of Health-System Pharmac*y **75** (2018), 774-783.
[10] P. Gallagher, P.O. Lang, A. Cherubini, E. Topinkova, A. Cruz-Jentoft, B. Montero Errasquin, et al., Prevalence of potentially inappropriate prescribing in an acutely ill population of older patients admitted to six European hospitals, *European Journal of Clinical Pharmacology* **67** (2011), 1175-1188.
[11] E.R. Hajjar, J.T. Hanlon, R.J. Sloane, C.I. Lindblad, C.F. Pieper, C.M. Ruby, et al., Unnecessary drug use in frail older people at hospital discharge, *Journal of the American Geriatrics Society* **53** (2005), 1518-1523.
[12] K.M. Cresswell, H. Mozaffar, L. Lee, R. Williams, and A. Sheikh, Workarounds to hospital electronic prescribing systems: a qualitative study in English hospitals, *BMJ Quality & Safety* (2016).
[13] M.T. Baysari, J. Del Gigante, M. Moran, I. Sandaradura, L. Li, K.L. Richardson, et al., Redesign of computerized decision support to improve antimicrobial prescribing. A controlled before-and-after study, *Applied Clinical Informatics* **8** (2017), 949-963.